SECTION 11 CONTENTS

Tables

DRINKING WATER

Throughout the Jordan River Basin, culinary water is used for all types of residential uses as well as for other municipal and industrial uses.

11.1 Introduction

This section describes the present drinking water systems in the Jordan River Basin, discusses present and future problems and presents estimated future requirements. For clarification purposes, this section, although titled "Drinking Water," addresses public water supplies distributed for public uses. Typical uses include indoor home use, lawn and garden watering, car washing, swimming pools, public parks and streets, fire protection, commercial enterprises, and schools. Many industries also receive water from municipal water systems. Industrial water use is discussed in Section 18.

11.2 Setting

At the present time, existing drinking water supplies are adequate and come from a rather complex mix of surface water and groundwater (including wells, springs and tunnels). Almost 99 percent of the public drinking water supplies come from 32 approved community drinking water systems (See Table 11-1 for listing). Approval of drinking water systems implies compliance with state regulations and water quality standards. In addition to the 32 primary community drinking water systems, there are an additional 46 small drinking water systems. These small systems, some approved and some unapproved, provide drinking water to a very limited clientele or service area such as a campground, a restaurant or a small subdivision.

The major water purveyors in the county are Salt Lake City, the Metropolitan Water District of Salt Lake City and the Salt Lake County Water Conservancy District. Most of the other approved water systems, despite having independent water sources, are dependent to some extent upon the purchase of water from one or more of these wholesalers.

The population served, total connections and monthly demand figures given in Table 11-1 show the relative size of the various drinking water systems. But the numbers are not additive. For instance, the Salt Lake County Water Conservancy District (SLCWCD) is shown as serving a population of 400,000. The SLCWCD, however, is primarily a wholesaler. The 400,000 figure incudes the populations served by their wholesale clients (e.g. Kearns Improvement District - 32,000, West Jordan City water system - 45,000, Granger Hunter Improvement District - 85,000 and others). In addition to domestic water users, the population served also includes estimates for commercial uses. Consequently, many individual users are counted two or more times in the table. For these reasons, any attempt to quantify domestic water usage by adding the population served, number of connections, or total monthly demands would be inappropriate. A summary of current uses and projected demands is shown in Table 9-4.

11.2.1 Background

The development of an urban water supply began with the arrival of the pioneers in 1847. City Creek, Red Butte Creek and Emigration Creek were put to immediate use for culinary and agricultural purposes. By 1860, nearly all of the nearby mountain streams were appropriated for agricultural uses with small communities established along their banks. Extensive use was also made of well water for household use. Early water rights were controlled through the hierarchy of The Church of Jesus Christ of Latter-day Saints (Mormons). As secular governmental structures emerged, control of water rights was shifted to city and territorial governments. Disputes concerning water rights were resolved by county water commissioners, and after statehood in 1896, through the Office of the State Engineer.

Table 11-1
COMMUNITY DRINKING WATER SYSTEMS
Jordan River Basin

Name	Population served	Total Connections	Monthly Demand (acre-feet)	Source	Treatment
Alta Town Water System	500	53	21.65	Tunnel	None
Bell Canyon Irrigation Co.	1,440	450	44.19	Wholesale	-
Bluffdale	1,400	517	29.46	Wholesale	-
Boundary Spring WUA	120	30	2.32	Spring	Chlorination
Copperton Improvement Dist.	800	277	51.36	Wells	Chlorination
Draper City Water System	200	75	9.04	Wholesale	None
Draper Irrigation Co.	5,200	1,850	243.04	Well/Stream	Complete
Foothill Water Co.	220	60	7.36	Wells	None
Granger-Hunter Imp. Dist.	85,000	22,000	184.12	Wells/Wholesale	None
Herriman Pipeline Co.	900	210	25.78	Spring/Well	Chlorination
Holladay Water Co.	14,900	3,705	434.53	Well/Spring/Wholesale	Chlorination
Kearns Imp. District	32,000	8,589	514.25	Wells/Wholesale	Chlorination
Magna Water Co & Imp Dist.	21,500	5,562	438.81	Wells/Wholesale	Chlorination
McDonald Condominiums	150	42	-	Wells	None
Metro Water Dist. of SLC	700,000	40	911.00	Surface	Complete
Midvale City Water System	10,142	2,632	324.05	Wells/Wholesale	None
Murray City Water System	31,000	7,956	125.24	Spring/Well/Wholesale	Chlorination
Riverton City Water System	12,000	3,028	206.22	Wells/Wholesale	None
Salt Lake City Water System	285,258	83,000	920.61	Surface/Wholesale/ Springs/Wells	Complete
Salt Lake County Water Conservancy District	400,000	7,706	718.07	Surface/Wholesale/ Springs/Wells	Complete
Sandy City Water System	82,000	23,500	589.19	Wells/Wholesale/Spring	Chlorination
Silver Fork Pipeline	200	192	5.90	Tunnel	None
Silver Lake Company	640	130	6.90	Tunnel	None
Salt Lake Co. Area #3	3,185	158	23.02	Springs\Tunnel	None
South Jordan City	14,000	3,768	312.12	Wholesale	None
South Salt Lake City	11,500	3,010	436.94	Wells	None
Spring Glen Water Co.	50	15	3.31	Wells	None
Taylorsville-Bennion WID	48,000	14,062	810.13	Wells/Wholesale	Chlorination
University of Utah	18,000	1,125	-	Well/Wholesale	None
Webb Well Water Users	75	38	3.68	Wells	None
West Jordan Water System	45,000	42,892	743.85	Wells/Wholesale	None
White City Water Co.	11,500	3,712	441.89	Wells/Wholesale	None

Source: Division of Drinking Water records.

Salt Lake City's population grew at a rapid pace, doubling between 1880 and 1888. The population doubled again between 1900 and 1920. City officials continued to acquire water rights during this period in the nearby canyon watersheds through court decrees and exchanges for Utah Lake water. Water rights in Little Cottonwood Creek and Parley's Creek were acquired in 1912, Mill Creek in 1913 and Big Cottonwood Creek in 1914. Just prior to the drought years of the early 1930s, Salt Lake City established a water advisory board to develop a long-range water program to meet its future needs. The 1931-1934 period of drought forced the city to drill more wells and to determine how best to increase its storage capacity. The Provo River Project was an outgrowth of these efforts. The Bureau of Reclamation initiated the project in the 1930s with its most notable feature, Deer Creek Reservoir, completed in 1941.

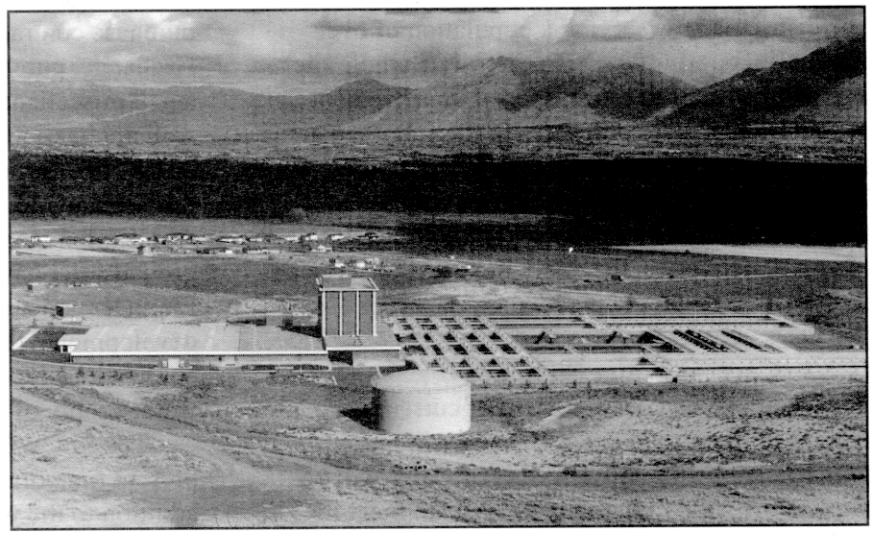
The Bureau of Reclamation required that a contracting entity be established to take responsibility for the repayment of project costs and to operate and maintain project facilities. The Provo Water Users Association was incorporated for these purposes in 1935. During the same year, the Metropolitan Water

District of Salt Lake City (MWD) was established to manage Salt Lake City's interests in the Provo River Project.

Salt Lake City established a policy in 1951 allowing the sale of water outside its corporate boundaries to retail customers in the growing suburbs along the east bench. With the addition of retail customers outside its boundaries, the population served doubled between 1940 and 1960. The metropolitan water district treatment plant was constructed in 1960 near the mouth of Little Cottonwood Canyon. At that time, Salt Lake City and the Metropolitan Water District served an equivalent population of 375,000 including residential customers in Salt Lake City and Salt Lake County.

Post World War II growth in the smaller municipalities and unincorporated communities (most notably the Kearns area), stimulated interest in developing a large-scale water supply for those areas. During the postwar years, most people in the Granger-Hunter area were served by individual or shared wells. When developers in the Kearns area proposed constructing a line to bring in water, several individuals in nearby areas asked to be included in the system. In response to petitions, the Salt Lake County Commission took action in the late 1940s to establish the Salt Lake County Water Conservancy District (SLCWCD), under the provisions of UCA Title 73, Chapter 9. The district came into existence in September 1951 and was charged with the responsibility for developing water sources and establishing a water conveyance system to serve communities south of 2100 South Street and west of Salt Lake City's suburban service area. The actual service area was defined partially through an unwritten agreement with the MWD.

Realizing early the development of local water sources would not keep up with the growth in population, the SLCWCD entered into an agreement in 1956 to participate in the Central Utah Project (CUP). During the 1960s, the SLCWCD continued to expand its conveyance systems, acquire and develop additional groundwater resources, and enter into agreements to purchase greater amounts of surplus water from the MWD. Because of delays in the construction of the CUP, originally scheduled for completion in the mid-1970s, the SLCWCD developed more groundwater sources and purchased increasing amounts of surplus water. The SLCWCD purchased as much as 25,000 acre-feet of surplus water from MWD in the early 1980s. In the past year, the SLCWCD purchased 10,000 acre-feet of water from the MWD and 20,000 acre-feet of water in Jordanelle Reservoir from the Central Utah Water Conservancy District. The Jordan Valley Water Treatment Plant was built in Bluffdale in 1974 and greatly improved the district's ability to serve areas on the west side of the valley.



Jordan Valley Water Treatment Plant

During the 1977 drought, MWD notified the SLCWCD the availability of surplus water could not be guaranteed throughout the high use period. The SLCWCD developed a contingency plan to restrict water use. When forced to implement the plan, the restrictions imposed on customers resulted in a 50 percent reduction in outside water use. Since the 1977 drought, the SLCWCD, in cooperation with the MWD and the Salt Lake City Public Works Department, has undertaken extensive efforts to locate new water resources and to increase water use efficiency. The *Area-Wide Water Study*, completed in April 1982, is a product of these efforts. Among other things, the study points out the need to develop additional storage facilities so that more of the local high quality waters lost in spring run-off can be

utilized. In 1989, the SLCWCD affected an exchange of Utah Lake water rights with the Provo Reservoir Water User's Company and in return obtained an average annual water supply of about 29,000 acre-feet consisting of 10,000 acre-feet of stored water in Deer Creek Reservoir and 19,000 acre-feet of direct flow water rights in the Provo and Weber rivers. It is apparent further development of other sources will be required even with full development of CUP water. The district is now serving a population of over 500,000. The SLCWCD is primarily a wholesale provider of water to cities, special improvement districts, and water companies in the suburban areas south and west of Salt Lake City's service area. Over 7,400 retail connections are also serving approximately 30,000 people. Through wholesale and retail deliveries, the district expects to serve an additional 300,000 people by the year 2005.

11.2.2 Current Water Supplies

When planned development of current water sources in the Jordan River Basin are in place, approximately 343,360 acre-feet of water will be available annually on a reliable basis to meet its public water needs (See Table 9-2). Of this total, 125,410 acre-feet is from groundwater sources, 1,060 acre-feet of artificial groundwater recharge, 61,850 acre-feet from local mountain streams, 61,700 from Deer Creek Reservoir, 84,000 acre-feet from the CUP and 9,600 acre-feet from the Welby/Jacob Exchange.

11.2.3 Metropolitan Water District of Salt Lake City

Salt Lake City has acquired an annual average water supply of approximately 167,000 acre-feet. This includes 61,700 acre-feet of storage in Deer Creek Reservoir controlled through the Metropolitan Water District of Salt Lake City. In addition, Salt Lake City obtains an average of 68,000 acre-feet each year from mountain streams, 20,000 acre-feet from the CUP, 17,600 acre-feet from springs and wells, and additional small quantities of water from miscellaneous sources. Salt Lake City's water supply can be characterized as "firm".

Salt Lake City's maximum daily demand coincides with the peak summer irrigation period and is 240 percent of the average daily demand. By the year 2020, it is estimated the Salt Lake City water system must be capable of delivering a maximum daily flow of 350 million gallons per day, an increase of 69 percent over the current peak flow of 220 million gallons per day.

11.2.4 Salt Lake County Water Conservancy District

The Salt Lake County Water Conservancy District obtains its water from 18 wells and two springs, from mountain streams in the southeast corner of Salt Lake Valley, the CUP through its water purchase contract with the CUWCD, the Welby-Jacob Exchange, purchases from MWD and additional small miscellaneous sources. The SLCWCD has filed well applications with the State Engineer for a total of 221.8 cfs of groundwater throughout the district. Of this amount, 46.74 cfs have been fully developed. Applications for the remaining 175.06 cfs of groundwater have been approved by the State Engineer and are being developed or held for future development. The district estimates that these applications represent a potential additional annual water supply of at least 10,000 acre-feet.

The SLCWCD has a firm water supply at the present time of approximately 100,000 acre-feet. In addition to the water it directly controls, the district has an agreement with the MWD (subject to availability) for an annual 10,000 acre-feet of treated Deer Creek Reservoir water. This agreement is valid through the year 2001, and may then terminate. Water from the MWD has been sufficient in most recent years to meet Salt Lake City needs and fulfill conditional commitments to the SLCWCD, but continued growth in Salt Lake City service areas will reduce water currently delivered to the SLCWCD. With this in mind, the SLCWCD has developed plans for other sources of water.

11.3 Organizations and Regulations

Although public drinking water supplies are subject to compliance with state and federal safe drinking water standards, it is the towns, cities and counties that have primary responsibility for drinking water supplies within their boundaries. Their responsibility and authority are spelled out in Sections 10, 11, 17, 19, and 73 of the *Utah Code Annotated, 1953, Amended.*

11.3.1 Local

As can be seen from Table 11-1, most of the incorporated cities (Alta, Bluffdale, Draper, Murray, Midvale, Salt Lake City, Sandy, South Jordan, South

Salt Lake, Riverton and West Jordan), have their own drinking water systems. Those that do not (Taylorsville and West Valley City) are served by the Taylorsville-Bennion Improvement District or the Granger-Hunter Improvement District. Additionally, many of the unincorporated communities also have their own drinking water systems either through the establishment of a water improvement district (i.e., Copperton, Kearns, Magna and White City) or through the establishment of a water company (i.e., Herriman and Holladay). Although most communities have constructed their own drinking water systems and have developed independent water sources, most rely heavily on the primary wholesale suppliers: Salt Lake County Water Conservancy District and the Metropolitan Water District of Salt Lake City.

11.3.2 State

The Division of Drinking Water is the state agency responsible for regulating and monitoring public drinking water systems. By action of the 1991 Utah Legislature, effective July 1, 1991, the Department of Environmental Quality was created, and the Bureau of Drinking Water/Sanitation was elevated to the Division of Drinking Water.

All public drinking water supplies are subject to the Utah Safe Drinking Water Act and Utah's Public Drinking Water Regulations. Laws and regulations are administered by the Department of Environmental Quality, Division of Drinking Water. In addition, the Utah Board of Health has regulatory control over public and individual drinking water systems and water well installation and construction. These responsibilities and duties are carried out through their staff. They work closely with the Department of Environmental Quality on related regulations. When private water systems are proposed to serve new developments, local planning commissions often ask the local health department to evaluate the feasibility of the water supply.

11.3.3 Federal

With the passage of the federal Safe Drinking Water Act (SDWA) in 1974, the federal government established national drinking water regulations to protect the public from water borne diseases. Congress expanded and strengthened the SDWA in 1986. The amended SDWA significantly increased the responsibility of the Environmental Protection Agency (EPA) to: 1) Establish maximum levels of contamination for established pollutants, 2) set compliance deadlines for owners/operators of treatment facilities in violation of federal regulations, 3) regulate surface water treatment associated with lead removal and wellhead disinfection, and 4) strengthen the enforcement of all regulations in the initial act.

Chemical, physical, radiological and bacteriological substances in drinking water which pose a health risk to the public are regulated by the EPA under provisions given in the SDWA. The EPA has established an extensive list of maximum contaminant levels (MCLs) for most common organic and inorganic contaminants.

The SDWA has also established a strict schedule to determine reasonable MCLs for a number of additional contaminants. As a result, additional contaminants are identified on a regular basis by the EPA and subject to new regulations.

To control and improve the aesthetic quality of drinking water supplies, the SDWA also includes a list of secondary maximum contamination levels (SMCLs) for water aesthetics such as taste, odor and color. Although the evaluation of these qualities is subjective, the measurement of SMCLs has allowed for a reasonable level of consistency in water aesthetics determinations from one supply to another.

The SDWA also requires state and local water provider agencies to monitor a specified list of regulated and unregulated contaminants. The selection of contaminants is dependant upon the number of people served, the water supply source and contaminants likely to be found. The standardized monitoring framework is administered over three, three-year compliance cycles for a nine-year total monitoring period beginning in 1992.

The 1986 SDWA amendments require all states to develop wellhead protection programs. The Division of Drinking Water has created the Drinking Water Source Protection Rule (DWSPR) outlining the general requirements to protect wellheads from outside surface contamination. Requirements of the DWSPR include preparing a *Drinking Water Source Protection* Plan for each groundwater source in all public water systems. Proof of ownership and maintenance of all land in and around wellheads where surface water contamination can occur is also required.

The 1996 amendments to the Safe Drinking Water Act created several new programs and included a total authorization of more than $12 billion in federal funds for various drinking water programs and activities nationwide from 1997 through 2003. The amendment provided $12.5 million to the Division of Drinking Water in a revolving fund program.

New capacity development provisions are added to the SDWA. The EPA must complete a review of existing state capacity development efforts and publish information to assist the states and public water suppliers with these efforts.

By August 6, 1998, the EPA must publish regulations requiring community water systems to prepare and distribute consumer confidence reports at least once a year. The governor of a state may decide not to apply the direct mailing requirement for consumer confidence reports to a community water system serving fewer than 10,000 people.

The EPA must publish a maximum contaminant level goal (MCLG) and promulgate a National Primary Drinking Water Regulation (NPDWR) for contaminants that: 1) may have an adverse effect on human health, 2) are known or are likely to occur in public water systems at a frequency and concentration of significance to public health, and 3) whose regulation offers a meaningful opportunity to reduce health risk for people served by public water systems.

The EPA must issue regulations establishing criteria for a monitoring program for unregulated contaminants. The regulations are to ensure that only a representative sample of systems serving 10,000 or fewer people are required to monitor. By August 6, 1999, and every five years thereafter, the EPA must issue a list of no more than 30 unregulated contaminants to be monitored by public water systems and included in the occurrence database.

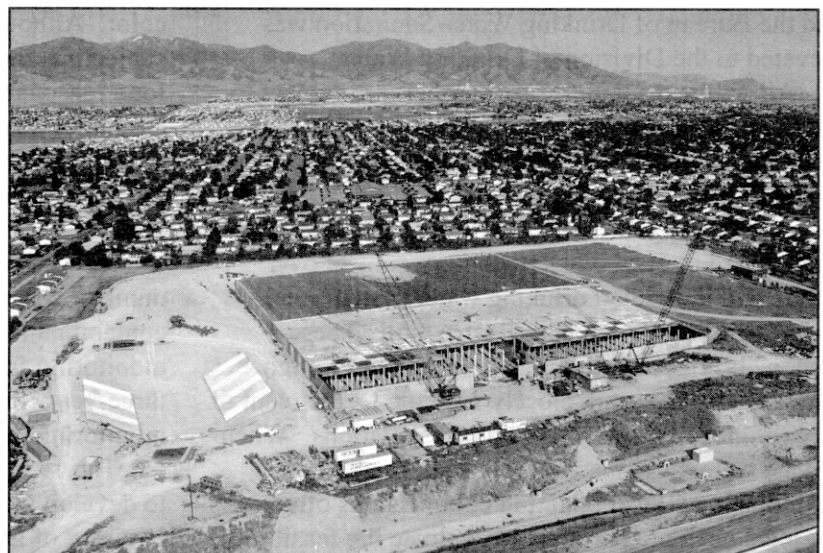
A new program is established authorizing the EPA to provide grants to states for the development and implementation of a state program to ensure the coordinated and comprehensive protection of groundwater resources within the state.

11.4 Culinary Water Use and Projected Demand

At the present time, approximately 255,700 acre-feet of high quality water is supplied annually by the major public water purveyors for various residential, commercial and industrial uses. By the year 2020, an estimated 419,300 acre-feet of water will be needed to meet the demands of population growth and increased commercial and industrial development.

Many small, unapproved water systems are located in the county, but they serve a very limited clientele. Virtually all of the delivered culinary water is treated at approved water treatment facilities. Table 11-2 lists the drinking water facilities and the plant capacity. Table 11-3 lists the major retail water providers along with the existing water use (1995) and the projected water demand (2020). These projections are based upon the existing water use pattern, anticipated population (See Table 4-1), and the Wasatch Front Water Demand/Supply Model.

In 1977, the state of Utah began a cooperative effort with the U.S. Geological Survey to quantify water use for public water suppliers and major self-supplied industries. The data are collected by the Division of Water Rights through questionnaires mailed each year to public water suppliers. The data for 1979 through 1993 are summarized in published reports. The 1994-95 data have not yet been published.



Jordan Aqueduct Terminal Reservoir under construction in West Valley

Table 11-2
WATER TREATMENT FACILITIES

Water Treatment Plant	Owner	Current Capacity (mgd)
City Creek	Salt Lake City	15
Parley's	Salt Lake City	40
Big Cottonwood	Salt Lake City	40
Metropolitan	M.W.D.	113
Southeast Regional	S.L.C.W.C.D.	20
Draper Irrigation Co.	Draper Irrigation Co.	5
Jordan Valley	C.U.W.C.D.*	180
Total Capacity		413

* Operated by the Salt Lake County Water Conservancy District. Ownership will pass to the SLCWCD (5/7) and the Metropolitan Water District of Salt Lake City (2/7).

Table 11-3
CURRENT AND PROJECTED CULINARY WATER DEMAND BY MAJOR WATER SUPPLIER
(acre-feet)

Water Supplier	1995	2020
Midvale	4,750	7,030
Magna	7,560	16,390
West Jordan	14,910	28,000
Murray	11,760	18,110
Holladay	3,920	5,150
Herriman	190	540
South Salt Lake City	5,620	9,070
Salt Lake City	100,020	142,990
Kearns	8,340	15,960
SL County WCD (retail)	12,570	18,190
Granger Hunter WID	26,750	49,800
Bluffdale	560	1,320
Sandy	25,500	42,600
Taylorsville-Bennion	15,640	25,080
Draper	3,320	7,760
Riverton	5,170	12,850
White City	3,840	5,420
South Jordan	5,280	13,040
Total	255,700	419,300

Source: Wasatch Front Water Demand/Supply Model, February 1996

11.5 Drinking Water Problems

11.5.1 Future Growth

Meeting the water needs of the growing population is probably the largest problem currently facing the culinary water providers. The rate of population increase for Salt Lake County is currently estimated to be 1.92 percent annually. This will yield a population of 1.28 million by the year 2020. It is anticipated that most of this growth will be centered in the south and southwestern portions of the valley; Draper, Riverton, South Jordan, Sandy, Taylorsville, West Jordan and West Valley City. The majority of these areas are serviced primarily by the Salt Lake County Water Conservancy District, and it is

anticipated the district will shoulder much of the responsibility to meet the increased water demands.

11.5.2 Deterioration of Facilities

Occasional repair, replacement, enlargement or upgrade of each system is necessary to maintain the level of service expected. The improvements cover a wide range of facilities, but they consist mainly of maintaining, operating and replacing wells, storage tanks and pipelines. Some communities have occasionally paid for these improvements without outside help, but most have made use of public funding programs. Specific funding programs are identified in Tables 8-3 and 8-4.

Salt Lake City has recently announced that it needs to upgrade its distribution system by replacing 50-year old deteriorated and undersized water mains. The cost estimates for this rehabilitation of existing infrastructure is in excess of $45 million.

11.5.3 Groundwater Contamination

Groundwater contamination has the potential of being a substantial problem. This is partly because groundwater makes up such a large part of the culinary water supply. An even larger concern is that groundwater contamination can go undetected until it becomes widespread and very expensive to mitigate. Even after detection it can be extremely difficult to quantify and contain.

At the present time, two groundwater contamination sites are identified in Salt Lake Valley; the Vitro tailings contamination site at about 700 West and 33rd South, and the Kennecott Utah Copper mineral tailings contamination site near Bingham/Herriman. Both sites are being monitored and slated for expensive clean-up and containment procedures. For more information on these two sites, see Section 19, Groundwater.

11.5.4 New Requirements

One problem faced by culinary water providers is the ever changing water quality standards and regulations. Today's water quality standards are more stringent than 20 years ago. It is likely standards will be even tougher 20 years from now. Several impending changes have already been mentioned in subsection 11.3 above. Changing standards and tougher regulations reflect society's growing awareness of the effects of pollution and the desire to better insulate itself from disease. The majority of the regulatory changes are beneficial to society.

The problem is that changing standards are not without cost. Any requirement to comply with higher water quality standards will result in higher water treatment costs. Sometimes new standards can be achieved with procedural changes resulting in minimal cost increases. Often, however, higher water quality standards will necessitate expensive infrastructural changes. This may well be the case for many water treatment facilities. It is quite possible that each of the treatment facilities will, over the next 20 years, face treatment cost increases that are in some way a result of regulatory changes.

11.5.5 Unapproved Systems

Although the vast majority of the public water supply comes from approved water systems, at any given time a number of public water supplies are not fully approved. Approval status is in a constant state of flux, with unapproved systems receiving approval as improvements take place, and occasionally approved systems lose approval status as violations occur. It is anticipated that water quality standards will become even more stringent in the future. The state regulatory agency, the Division of Drinking Water, and state funding agencies should work together to provide unapproved system owners with every possible assistance in achieving approval.

11.6 Alternative Solutions

The development of additional culinary water sources to meet the needs of an expanding population will be dependant upon rate of growth and the type of development that occurs. Additional culinary water could come from a number of sources, including further development of Wasatch Front Mountain streams, additional groundwater development, imported Bear River/Weber River water and treatment of Jordan River water. For a discussion of these development alternatives as well as the issues and recommendations associated with meeting future growing water needs, see Section 9, Water Planning and Development, and Section 19, Groundwater. ■